

# Pacific Northwest National Laboratory

Operated by Battelle for the  
U.S. Department of Energy

June 9, 2006

Mr. Roger F. Christensen  
Director, Operations Division  
Pacific Northwest Site Office  
U.S. Department of Energy  
P.O. Box 350, K8-50  
Richland, WA 99352

Dear Mr. Christensen:

## REGISTRATION OF NEW UNDERGROUND INJECTION CONTROL WELL LOCATED AT THE ENVIRONMENTAL MOLECULAR SCIENCES LABORATORY

Attached is a transmittal letter to be sent to the Washington State Department of Ecology (Ecology), to register a new underground injection control (UIC) well at the Environmental Molecular Sciences Laboratory (EMSL). The UIC well will collect stormwater from the rooftop of the new addition to the EMSL.

Included as part of the transmittal to Ecology is the UIC registration package which contains the UIC Registration Form and supporting attachments. If you have any questions or require additional information, please contact Ms. Liz Raney at (509) 531-8987 or Mr. Tom Moon at (509) 376-1271.

Sincerely,



Roby D. Enge, Director  
Environment, Safety, Health and Quality

RDE/EAR/tp

Attachment

902 Battelle Boulevard • P.O. Box 999 • Richland, WA 99352

Mr. Roger F. Christensen

June 9, 2006

Page 2

cc : Theresa L. Aldridge, PNSO  
Terry L. Davis, PNSO  
Ron L. Higgins, PNSO

Mr. Roger F. Christensen  
June 9, 2006  
Page 3

bcc: David R. Brawn  
Steven D. Cooke  
Eric G. Damberg  
Paul J. Dotson  
Alice K. Ikenberry  
Michael W. McCoy  
Kenneth E. McMullin  
Tom W. Moon  
Elizabeth A. Raney  
Monty L. Rosbach  
Harold T. Tilden  
Rodger K. Woodruff  
EAR:LB  
RDE:File/LB  
EM: 1830 LIQUID RIDS – T07.4.11

Attachment

**Attachment**

Transmittal Letter and Enclosure to Mary Shaleen-Hansen,  
Washington State Department of Ecology



**Department of Energy**  
Pacific Northwest Site Office  
P.O. Box 350, K8-50  
Richland, Washington 99352

~~XX~~-OD-~~XXX~~

Ms. Mary Shaleen Hansen  
UIC Program Coordinator  
Water Quality Program  
Washington State Department of Ecology  
P.O. Box 47600  
Olympia, Washington 98504-7600

Dear Ms. Shaleen Hansen:

**REGISTRATION OF NEW UNDERGROUND INJECTION CONTROL WELL LOCATED AT  
THE ENVIRONMENTAL MOLECULAR SCIENCES LABORATORY**

The purpose of this letter is to register one new underground injection control (UIC) well to be located at the Environmental Molecular Sciences Laboratory (EMSL). The well is a Class V, 5D2 injection well and will be used to collect stormwater from the rooftop of a new addition to be constructed on the EMSL.

The enclosed UIC Registration Package contains the UIC Registration Form and supporting attachments.

If you have any questions or require additional information regarding this submittal, please contact Theresa Aldridge, Operations Division, on (509) 372-4508.

Sincerely,

Roger F. Christensen, Director  
Operations Division

enclosure

OD:TLA

cc w/ enclosure:

K. A. Conaway, Ecology  
A. K. Ikenberry, PNNL  
K.E. McMullin, PNNL  
R.K. Woodruff, PNNL

bcc w/ enclosure:

T. L. Aldridge, OD  
R. L. Higgins, OD

RECORD NOTE: None.

File Name: ~~XX~~-OD-~~XXX~~ tla

**Enclosure**

Transmittal Letter and UIC Registration Package to Mary Shaleen-Hansen,  
Washington State Department of Ecology



# Underground Injection Control Program Registration Form

Please send completed form to: UIC Coordinator, Water Quality Program, WA Department of Ecology, P.O. Box 47600, Olympia, WA 98504-7600

To expedite the registration of your facility, fill out this form in its entirety.

## A. Facility/Site Information:

1. Facility Name:	William R. Wiley Environmental Molecular Sciences Laboratory								
2. Address:	3335 Q Avenue (Building 3020)								
City/State/Zip:	Richland, WA 99354	County:	Benton						
Telephone #:	(509) 373-EMSL (3675)								
Cross Streets:	North/South W Avenue	East/West	Horn Rapids Road						
3. Township	10N	Range:	28E	Section:	14	¼ Section	SW	¼ ¼ Section:	NW
4. Nature of business and materials handled:	<u>EMSL is a national user facility where scientific research and development are performed on physical, chemical, and biological processes. A portion of these activities involves laboratory work using a variety of chemicals in small quantities depending on the nature of the research activity.</u>								
5. Pollution prevention/treatment methods used at site	<u>All chemicals and wastes are stored either indoors or in roofed or enclosed areas to prevent contact with precipitation. There is no chemical storage on the rooftop. Access to the rooftop is controlled and only minimal amounts of chemicals are used on the roof for maintenance activities. All spills are reported per facility spill response procedures.</u>								
6. Has a permit been issued for the site?	No	<input checked="" type="checkbox"/>	Yes, NPDES	<input type="checkbox"/>	State Waste Discharge	<input type="checkbox"/>			
Issued By:	N/A								

## B. Owner/Operator Information:

1. Owner Name:	U.S. Department of Energy, Pacific Northwest Site Office		
Owner Address:	P.O. Box 350, MSIN K8-50		
City/State/Zip:	Richland, WA 99352		
Telephone No:	(509) 372-4900		
2. Operator/Contact Name:	Pacific Northwest National Laboratory, Alice Ikenberry		
Operator/Contact Address:	P.O. Box 999, MSIN J2-25		
City/State/Zip:	Richland, WA 99352		
Telephone No:	(509) 373-5638		

**C. Ground Water Information:**

1. Distance from UIC well to nearest drinking water source (feet) from the UIC well:	~6,000 feet (City of Richland Aquifer Recharge Area)
2. Distance from UIC well to nearest surface water (lake or river source (feet):	~3,000 feet (closest point to Columbia River)

**D. Remediation Sites (if applicable):**

1. Type of remediation site CERCLA <input type="checkbox"/> RCRA <input type="checkbox"/> MTCA Independent <input type="checkbox"/> MTCA Order <input type="checkbox"/> Other <input type="checkbox"/> <b>N/A</b>
2. Groundwater quality (including contaminant levels): <u>N/A</u>
3. Brief description of site geology: The site consists of 1- to 4-foot thick topsoil overlying poorly graded gravel (4.75 mm - 1 3/8 in, subrounded and rounded) with some interbedded layers of sand and silt. Groundwater is anticipated to be approximately 45 feet below the site.
4. Injection process, including volume amounts (gals.): <u>N/A</u>

**E. UIC Well Information for Site**

UIC well type	UIC well count	Well status: active (AC), permanently abandoned (PA); under construction (UC)	UIC well depth (in feet)	Approximate date when UIC well was installed	Latitude (in degrees and decimal minutes (46.000))	Longitude (in degrees and decimal minutes (121.000))	Where does the fluid drain from? i.e., if stormwater, does it drain from the roof, loading dock, inside floor drain
For Example 5D2	1	AC	5		46.000	121.000	Storm water from residential road way
5D2	1	UC	2	August 2006	46.348	119.277	Storm water from roof. (IB-8)

\*\*Infiltration Basin (IB) location and configuration are on drawings included as Attachment 1, noted as IB-8. Infiltration basin Best Management Practices are included as Attachment 2.

## EPA Well Types

5A19 Cooling water return	5R21 Aquifer recharge	5W31 Septic system (well disposal)	5X28 Motor vehicle waste
5D2 Stormwater	5W9 Untreated sewage	5W32 Septic system (drainfield)	
5D4 Industrial stormwater runoff	5W10 Cesspool	5A7 Closed loop heat pump return	
5G30 Special drainage water	5W11 Septic system (gen)	5X26 Aquifer remediation	
5A6 Geothermal heat	5W20 Industrial process water	5X27 Other wells	

Completed by: Roger F. Christensen

Date: June 2, 2006

For questions, call Mary Shaleen-Hansen at 360-407-6143 or e-mail can be sent to [maha461@ecy.wa.gov](mailto:maha461@ecy.wa.gov).

# **Attachment 1 – Infiltration Basin Design Drawings**

H-3-310626, Sheet 1 and 2, Civil Underground Utility Lines Site Plan





## **Attachment 2 – Best Management Practice F6.22**

## **BMP F6.22 Infiltration Trenches**

This section covers design, construction, and maintenance criteria specific for infiltration trenches. UIC regulations apply only when perforated pipe is installed in the trench; see Chapter 5.6.

### ***Description***

Infiltration trenches are generally at least 24 inches wide, and are backfilled with a coarse stone aggregate, allowing for temporary storage of stormwater runoff in the voids of the aggregate material. Stored runoff then gradually infiltrates into the surrounding soil. The surface of the trench can be covered with grating and/or consist of stone, gabion, sand, or a grassed covered area with a surface inlet. Perforated rigid pipe of at least 8-inch diameter can also be used to distribute the stormwater in a stone trench.

The infiltrator bed has been designed to provide a designated area for the roof storm drainage for a new building addition. The bed will be constructed of a series of 63 polyethylene chambers specifically designed for use as infiltrators measuring 34 inches wide and 75 inches long. The configuration of the chambers provides storage void space for the runoff. The chambers will be connected together to form on large infiltrator bed measuring 25'-6" wide by 43'-9" long (see Attachment 1, drawing H-3-310626, Sheet 2, Detail 1). The infiltrator bed will be placed on the level bed of crushed rock with drainage rock placed around and between the individual sections. The infiltrator will have an upstream section consisting of three chambers in line with the inlet pipe to act as a settling chamber 2'-10" wide by 18'-9" long with three 4" inspection ports at grade. The infiltrator will be covered with native fill material and sod (see Attachment 1, drawing H-3-310626, Sheet 2, Detail D). The infiltrator chambers are "Sidewinder" high capacity series manufactured by Infiltrator Systems, Inc. Attachment 3 contains the product literature for the infiltration chambers.

### ***Design Criteria***

See Figures 6.3.5 - 6.3.8 for examples of trench designs.

No Requirement

See Appendix 6B or Table 5.4.1 for design infiltration rates. Check with the local jurisdiction for outflow capacity requirements.

The local jurisdiction, the City of Richland, has no rules, requirements, or regulations regarding the installation of storm water dry wells.

Due to accessibility and maintenance limitations infiltration trenches must be carefully designed and constructed. The local jurisdiction should be contacted for additional specifications.

The local jurisdiction, the City of Richland, has no rules, requirements, or regulations regarding the installation of storm water dry wells.

Consider including an access port or open or grated top for accessibility to conduct inspections and maintenance.

Access ports will be included in the design as shown in Attachment 1, drawing H-3-310626, Sheet 2, Details C and E. The infiltration bed is installed below grade precluding the use of a grated top.

Backfill Material - The aggregate material for the infiltration trench should consist of a clean aggregate with a maximum diameter of 3 inches and a minimum diameter of 1.5 inches. Void space for these aggregates should be in the range of 30 to 40 percent. For calculations assume a void space of 30 percent maximum.

The infiltrator bed will have a six inch to twelve inch layer of 1" - 1 1/2" drainage rock placed around and between each chamber section to aid in infiltration. This additional material is not needed for design, but will allow for quicker leaching of storm water. Topsoil and grass are replaced on top (see Attachment 1, drawing H-3-310626, Sheet 2, Detail D).

Perforated Pipe - a minimum of 8-inch perforated pipe should be provided to increase the storage capacity of the infiltration trench and to enhance conveyance of flows throughout the trench area.

The perforated pipe will be 4" diameter. However the infiltration chamber is approximately 34" wide and 16" tall. These dimensions will enhance the conveyance of flows throughout the infiltration bed.

Geotextile fabric liner - The aggregate fill material shall be completely encased in an engineering geotextile material. In the case of an aggregate surface, geotextile should surround all of the aggregate fill material except for the top one-foot, which is placed over the geotextile. Geotextile fabric with acceptable properties must be carefully selected to avoid plugging.

The infiltrator bed and drainage fill will be completely covered with a non-woven geotextile fabric, though the chamber manufacturer does not require the fabric covering. The design of the chambers prohibits silting of the chambers though a "shingled" layering of exfiltration ports.

The bottom sand or geotextile fabric as shown in the attached figures is optional.

The infiltration chambers will be placed on a bed of crushed rock for stability. No geotextile fabric is planned for the bottoms of the chambers.

Refer to the WSDOT Design Manual, Section 530, pages 1 through 24, where geosynthetics are discussed. This section contains information on functions and applications, types and characteristics, and design approaches. The WSDOT 2002 Standard Specifications, English units version, section 9-33, includes specifications for geotextiles, classed pursuant to the design manual discussions and definitions.

Infiltration bed 8 has been designed to match the current EMSL storm water infiltrator beds. The existing beds have been in use for over 10 years and have proven to be very effective.

Refer to the Federal Highway Administration Manual "Geosynthetic Design and Construction Guidelines," Publication No. FHWA HI-95-038, May 1995 for design guidance on geotextiles in drainage applications. Refer to the NCHRP Report 367, "Long-Term Performance of Geosynthetics in Drainage Applications," 1994, for long-term performance data and background on the potential for geotextiles to clog, blind, or to allow piping to occur and how to design for these issues.

Infiltration bed 8 has been designed to match the current EMSL storm water infiltrator beds. The existing beds have been in use for over 10 years and have proven to be very effective.

Surface Cover - A stone filled trench can be placed under a porous or impervious surface cover to conserve space.

N/A

Observation Well - An observation well should be installed at the lower end of the infiltration trench to check water levels, drawdown time, sediment accumulation, and conduct water quality monitoring. Figure 6.3.9 illustrates observation well details. It should consist of a perforated PVC pipe which is 4 to 6 inches in diameter and it should be constructed flush with the ground elevation. For larger trenches a 12-36 inch diameter well can be installed to facilitate maintenance operations such as pumping out the sediment. The top of the well should be capped to discourage vandalism and tampering.

A set of three 4" access pipes are included in the design for the inflow settling chamber similar to the existing proven EMSL Infiltrator settling chambers.

Catch Basin and Tee - A tee section should be provided in the nearest catch basin upstream of the infiltration trench if a catch basin is used. The tee will trap floatable debris and oils.

This storm water infiltration system does not include catch basins.

### ***Construction Criteria***

Trench Preparation - Excavated materials must be placed away from the trench sides to enhance trench wall stability. Care should also be taken to keep this material away from slopes, neighboring property, sidewalks and streets. It is recommended that this material be covered with plastic.

Construction activities will take place in accordance with best management practices for soils handling. These will include practices to enhance trench wall stability for worker safety, and control the spread of soils piles to neighboring property, sidewalks, and streets.

Stone Aggregate Placement and Compaction - The stone aggregate should be placed in lifts and compacted using plate compactors. As a rule of thumb, a maximum loose lift thickness of 12 inches is recommended. The compaction process ensures geotextile conformity to the excavation sides, thereby reducing potential piping and geotextile clogging, and settlement problems.

The infiltration bed is composed of a set of engineered chambers and will have drainage rock placed around and between each chamber in a 6" - 12" layer for added drainage. (see Attachment 1, drawing H-3-310626, Sheet 2, Detail D).

Potential Contamination - Prevent natural or fill soils from intermixing with the stone aggregate. All contaminated stone aggregate must be removed and replaced with uncontaminated stone aggregate.

No contamination is expected to be found in soils at this site. Any contaminated materials excavated at the site will be replaced with clean fill and disposed of in accordance with all applicable regulations.

Overlapping and Covering - Following the stone aggregate placement, the geotextile must be folded over the stone aggregate to form a 12 inch minimum longitudinal overlap. When overlaps are required between rolls, the upstream roll should overlap a minimum of 2 feet over the downstream roll in order to provide a shingled effect.

The engineered infiltration chambers do not require a fabric covering due to the shingled effect of the drainage ports. A fabric will be included in the design with overlaps in accordance with the manufacturer's instructions.

Voids behind Geotextile - Voids between the geotextile and excavation sides must be avoided. Removing boulders or other obstacles from the trench walls is one source of such voids. Natural soils should be placed in these voids at the most convenient time during construction to ensure geotextile conformity to the excavation sides. Soil piping, geotextile clogging, and possible surface subsidence should be avoided by this remedial process.

Construction activities will be performed in such a way as to minimize void spaces and prevent soil piping, geotextile clogging, and surface subsidence.

Unstable Excavation Sites - Vertically excavated walls may be difficult to maintain in areas where the soil moisture is high or where soft or cohesionless soils predominate. Trapezoidal, rather than rectangular, cross sections may be needed.

Excavations will be performed as appropriate for worker safety and hazard minimization for the field conditions at the site.

#### ***Maintenance Criteria***

Sediment buildup in the top foot of stone aggregate or the surface inlet should be monitored on the same schedule as the observation well.

The system will be included in current EMSL monitoring program.

## **Attachment 3 – Sidewinder® Product Literature**

The High Capacity  
**SideWinder®**  
Chamber

**INFILTRATOR®**  
**SYSTEMS INC**  
*Environmental Onsite Wastewater Solutions™*



Infiltrator's revolutionary, patented SideWinder sidewall design provides the largest effective infiltrative surface area per linear foot. This performance advantage is combined with the large total storage capacity of this High Capacity model. With 12" of compacted cover, it supports 16,000 lbs/axle, equivalent to an H-10 AASHTO rating.

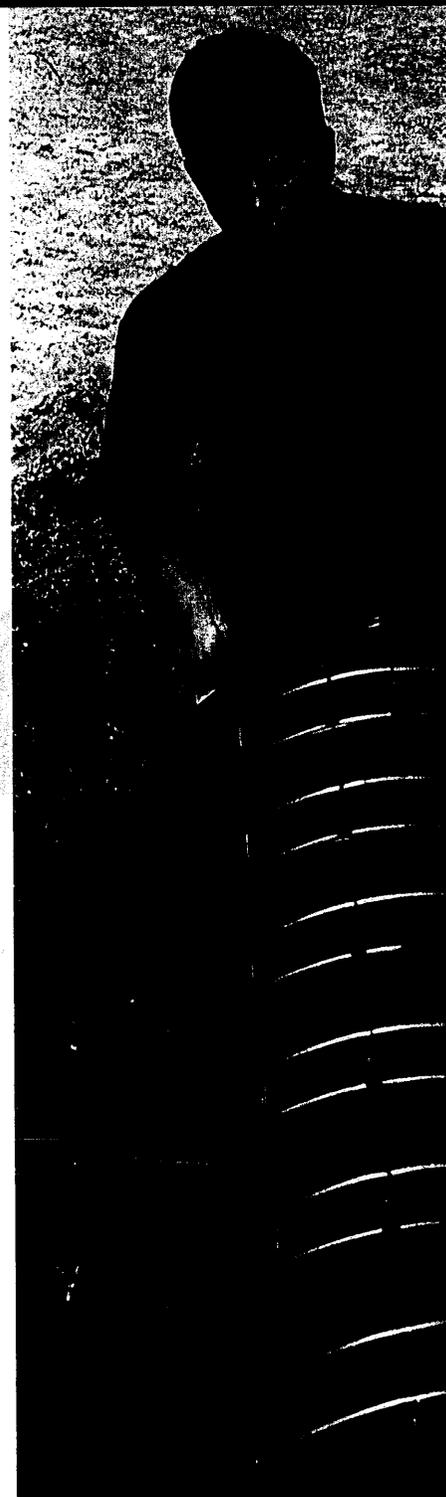
**The High Capacity SideWinder Chamber System Offers You These Unique Benefits:**

- Top infiltrative performance per linear foot
- Easy assembly and installation with as few as two people, a back-hoe and a pickup truck
- Lightweight chambers that can be delivered in one pickup truck load and hand-carried into position
- Extra temporary storage capacity
- Inspection port option for easy access to leachfield with no site disruption
- Solid-topped chambers that need no geotextile
- **OVERALL REDUCED COST**

**Tested and Proven with More than One Million Systems Installed**

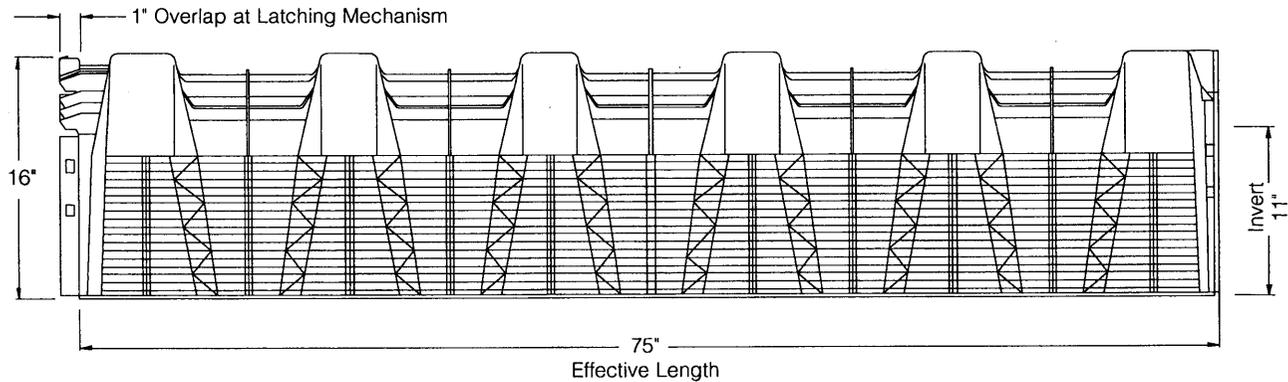
- Infiltrator is the number-one septic leachfield chamber system in the onsite industry.
- More than one million systems have been installed, with over 27 million units in-ground in all 50 states and 24 countries.
- Infiltrator's established history of performance and reliability began in 1987.
- Field surveys show that Infiltrator chamber systems, at 50% reduced sizing, perform equivalent to full-size stone and pipe systems.
- Infiltrator is ISO 9001:2000 certified and is IAPMO tested and UPC approved.

Approved in \_\_\_\_\_

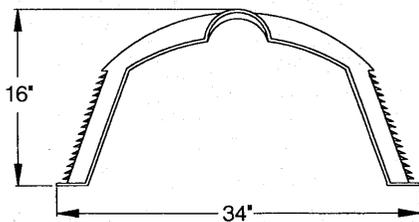


# The High Capacity SideWinder® Chamber

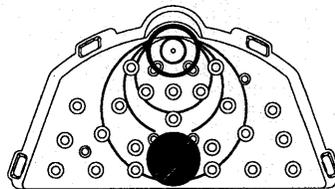
## The High Capacity SideWinder Chamber



**Chamber End View**



**PosiLock™ End Plate**



### Specifications

Size (W x L x H)	34" x 75" x 16" (85 cm x 191 cm x 11 cm)
Storage Capacity	112.5 gal (426 L)
Weight	37 lbs (16.8 kg)
Louvered Sidewall Height	10" (25 cm)

#### INFILTRATOR SYSTEMS, INC. STANDARD LIMITED WARRANTY

##### INFILTRATOR SYSTEMS, INC., ("Infiltrator") STANDARD LIMITED WARRANTY FOR SEPTIC PRODUCTS

(a) The structural integrity of each chamber and end plate manufactured by Infiltrator (collectively referred to as "Units"), when installed and operated in a leachfield of an onsite septic system in accordance with Infiltrator's installation instructions, is warranted to the original purchaser ("Holder") against defective materials and workmanship for one (1) year from the date upon which a septic permit is issued for the septic system containing the Units; provided, however, that if a septic permit is not required for the septic system by applicable law, the one (1) year warranty period will begin upon the date that installation of the septic system commences. In order to exercise warranty rights, Holder must notify Infiltrator in writing at its corporate headquarters in Old Saybrook, Connecticut, within fifteen (15) days of the alleged defect. Infiltrator will supply replacement Units for those Units determined by Infiltrator to be defective and covered by this Limited Warranty. Infiltrator's liability specifically excludes the cost of removal and/or installation of the Units.

(b) THE LIMITED WARRANTY AND REMEDIES IN SUBPARAGRAPH (a) ARE EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE UNITS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

(c) The Limited Warranty does not extend to incidental, consequential, special or indirect damages. Infiltrator shall not be liable for penalties or liquidated damages, including loss of production and profits, labor and materials, overhead costs or other losses or expenses incurred by the Holder or any third party. Specifically excluded from Limited Warranty coverage is damage to the Units due to ordinary wear and tear, alteration, accident, misuse, abuse or neglect of the Units; the Units being subjected to vehicle traffic or other conditions which are not permitted by the installation instructions; failure to maintain the minimum ground covers set forth in the installation instructions; the placement of improper materials into the system containing the Units; failure of the Units or the septic system due to improper siting, improper sizing, excessive water usage, improper grease disposal or improper operation or any other event not caused by Infiltrator. This Limited Warranty shall be void if the Holder fails to comply with all of the terms set forth in this Limited Warranty. Further, in no event shall Infiltrator be responsible for any loss or damage to the Holder, the Units, or any third party resulting from installation or shipment, or from any product liability claims of Holder or any third party. For this Limited Warranty to apply, the Units must be installed in accordance with all site conditions required by state and local codes, all other applicable laws and Infiltrator's installation instructions.

(d) No representative of Infiltrator has the authority to change this Limited Warranty in any manner whatsoever, or to extend this Limited Warranty. No warranty applies to any party other than the original Holder.

The above represents the standard Limited Warranty offered by Infiltrator. A limited number of states and counties have different warranty requirements. Any purchaser of Units should contact Infiltrator's corporate headquarters in Old Saybrook, Connecticut, prior to such purchase, to obtain a copy of the applicable warranty and should carefully read that warranty prior to the purchase of Units.

Infiltrator Systems does not recommend installing onsite systems under pavement. Chambers must be installed according to manufacturer's instructions. Failure to install according to manufacturer's instructions will void warranty. Infiltrator Systems recommends the use of septic tank filters and laundry filters with all onsite septic systems.

# INFILTRATOR®

## SYSTEMS INC

*Environmental Onsite Wastewater Solutions™*

6 Business Park Road • P.O. Box 768  
Old Saybrook, CT 06475  
860-577-7000 • FAX 860-577-7001

**1-800-221-4436**  
**www.infiltratorsystems.com**

**For technical assistance, installation instructions or customer service, call Infiltrator Systems at 1-800-221-4436.**

U.S. Patents: 4,759,661; 5,017,041; 5,156,488; 5,336,017; 5,401,116; 5,401,459; 5,511,903; 5,716,163; 5,588,778; 5,839,844  
Canadian Patents: 1,329,959; 2,004,564 Other patents pending.

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